

**AMENDMENTS TO THE SPECIFICATION**

**Please replace the paragraph on page 7, lines 6-26, with the following amended paragraph:**

Furthermore, the reduction potentials of many quaternary ammonium salts are nobler than the reduction potential of vinylene carbonate. It is therefore thought that in the nonaqueous-electrolyte battery according to the invention, a protective coating film is surely formed in an earlier stage in first charge than in the nonaqueous-electrolyte battery employing vinylene carbonate according to a related-art technique. In addition, the protective coating film formed on the surface of the negative electrode by the decomposition of the quaternary ammonium salt is dense and has excellent permeability to lithium ions. Thus, by merely adding an only slight amount of a quaternary ammonium salt, ~~the other organic solvent~~ the organic solvent constituting the nonaqueous electrolyte can be more effectively inhibited from decomposing. Consequently, a nonaqueous-electrolyte battery having a high charge/discharge efficiency and a high energy density can be obtained. Incidentally, since quaternary ammonium salts themselves have substantially no volatility and have high thermal stability because they are salts, the addition thereof does not impair battery safety at all.

**Please replace the paragraph on page 8, lines 17-20, with the following amended paragraph:**

(wherein R1, R2, R3, and R4 each are either an alkyl group having 1-6 carbon atoms or an alkyl group in which at least part of the hydrogen atoms ~~have~~ each has been replaced by a fluorine atom; and X<sup>-</sup> is a fluorine-containing anion)

**Please replace the paragraph on page 9, lines 2-8, with the following amended paragraph:**

(wherein R is a divalent organic linking group having a main chain which has 4-5 atoms and is constituted of at least one member selected from carbon, oxygen, nitrogen, sulfur, and phosphorus; R1 and R2 each are either an alkyl group having 1-6 carbon atoms or an alkyl group in which at least part of the hydrogen atoms ~~have~~ each has been replaced by a fluorine atom; and X<sup>-</sup> is a fluorine-containing anion)

**Please replace the paragraph on page 9, lines 10-18, with the following amended paragraph:**

(wherein R is an organic linking group or an organic linking group forming an aromatic ring,  
the

organic linking groups each having a main chain which has 4-5 atoms and is constituted of at least one member selected from carbon, oxygen, nitrogen, sulfur, and phosphorus and having one single-bond end and one double-bond end; R1 is an alkyl group having 1-6 carbon atoms or an alkyl group in which at least part of the hydrogen atoms ~~have~~ each has been replaced by a fluorine atom; and X<sup>-</sup> is a fluorine-containing anion).

**Please amend the paragraph page 10, lines 1-11, with the following amended paragraph:**

Due to this constitution, a nonaqueous electrolyte can be provided which enables a lithium ion-permeable protective coating film which is denser and has higher permeability to lithium ions to be formed during first charge on the surface of the negative electrode of the battery employing the electrolyte to thereby effectively inhibit the decomposition of ~~the other organic solvent~~ the organic solvent constituting the nonaqueous electrolyte, and which enables the battery to be sufficiently charged/discharged in the second and subsequent cycles and thereby have an improved charge/discharge efficiency.

**Please replace the paragraph on page 16, lines 7-25 with the following amended paragraph:**

The amount of the quaternary ammonium salt to be incorporated in the nonaqueous electrolyte of the invention is 0.06 mol/L or larger and 0.5 mol/L or smaller based on ~~the whole weight~~ the whole amount of the nonaqueous electrolyte. Preferably, the amount thereof is 0.1-0.35 mol/L. In case where the amount of the quaternary ammonium salt contained is smaller than 0.06 mol/L based on ~~the whole weight~~ the whole amount of the nonaqueous electrolyte, ~~the other organic solvent~~ the organic solvent constituting the nonaqueous electrolyte cannot be sufficiently inhibited from decomposing during first charge, making it difficult to sufficiently charge the battery. On the other hand, in case where the amount of the quaternary ammonium salt contained exceeds 0.5 mol/L, it is impossible to sufficiently heighten the charge efficiency and high-rate discharge characteristics. The reasons for this may be because the nonaqueous electrolyte comes to have an increased viscosity and the protective coating film comes to have increased resistance, although presumptions are included.

**Please replace the paragraph on page 19, line 22, through page 20, line 17 with the following amended paragraph:**

A mixture of any of those lithium-containing compounds with another positive active

material may be used. Examples of the positive active material usable besides the lithium-containing compounds include compounds of a Group I metal, such as CuO, Cu<sub>2</sub>O, Ag<sub>2</sub>O, CuS, and CuSO<sub>4</sub>, compounds of a Group IV metal, such as TiS<sub>2</sub>, SiO<sub>2</sub>, and SnO, compounds of a Group V metal, such as V<sub>2</sub>O<sub>5</sub>, V<sub>6</sub>O<sub>12</sub>, VO<sub>x</sub>, Nb<sub>2</sub>O<sub>5</sub>, Bi<sub>2</sub>O<sub>3</sub>, and Sb<sub>2</sub>O<sub>3</sub>, compounds of a Group VI metal, such as CrO<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>, MoO<sub>3</sub>, MoS<sub>2</sub>, WO<sub>3</sub>, and SeO<sub>2</sub>, compounds of a Group VII metal, such as MnO<sub>2</sub> and Mn<sub>2</sub>O<sub>3</sub>, compounds of a Group VIII metal, such as Fe<sub>2</sub>O<sub>3</sub>, FeO, Fe<sub>3</sub>O<sub>4</sub>, Ni<sub>2</sub>O<sub>3</sub>, NiO, CoO<sub>3</sub>, and CoO, and metal compounds represented by the general formula Li<sub>x</sub>MX<sub>2</sub> or Li<sub>x</sub>MN<sub>y</sub>X<sub>2</sub> (wherein M and N each represent a metal in Groups I to VIII, and X represents a ~~chalcogen compound~~ chalcogen atom such as oxygen or sulfur) such as, e.g., lithium-cobalt composite oxides and lithium-manganese composite oxides. Examples thereof further include conductive polymeric compounds, such as disulfides, polypyrrole, polyaniline, poly-p-phenylene, polyacetylene, and polyacene materials, and carbonaceous materials of the pseudo-graphite structure. However, usable positive active materials should not be construed as being limited to these examples.

**Please replace the paragraph on page 20 line, 18 through page 21, line 11 with the following amended paragraph:**

Examples of the negative-electrode material to be used as a main component of the negative electrode include carbonaceous materials, metal oxides such as tin oxides and silicon oxides, and materials obtained by modifying these materials by adding phosphorus or boron for the purpose of

improving negative-electrode properties. Of carbonaceous materials, graphites have an operating potential very close to that of metallic lithium and are hence effective in diminishing self-discharge when a lithium salt is employed as an electrolyte. Furthermore, graphites are effective in reducing the irreversible capacity in charge/discharge. Consequently, graphites are preferred negative-electrode materials. In addition, since the nonaqueous electrolyte containing a quaternary ammonium salt is used in the invention, ~~the other organic solvent~~ the organic solvent constituting the nonaqueous electrolyte can be surely inhibited from decomposing on the negative electrode comprising a graphite as a main component during charge. The advantageous properties of the graphite shown above can hence be surely exhibited.

**Please replace the paragraph on page 22, line 20, through page 23, line 10 with the following amended paragraph:**

A powder of the positive active material and a powder of the negative-electrode material desirably have an average particle size of 100  $\mu\text{m}$  or smaller. In particular, it is desirable that the average particle size of the powder of the positive active material be 10 $\mu\text{m}$  or smaller for the purpose of improving the high-output characteristics of the nonaqueous-electrolyte battery. A pulverizer and a classifier are used for obtaining a powder having a given ~~shape~~ size. For example, use is made of a mortar, ball mill, sand mill, oscillating ball mill, planetary ball mill, jet mill, counter jet mill, or cyclone type jet mill and sieves or the like. Pulverization may be conducted by wet pulverization

in which water or an organic solvent, e.g., hexane, coexists. Methods of classification are not particularly limited, and sieves, an air classifier, or the like is used in each of dry and wet processes according to need.

**Please replace the paragraph on page 25, line 23, through page 26, line 17 with the following amended paragraph:**

As the current collector may be used any electron conductor which does not exert an adverse influence in the battery fabricated. For example, the current collector for the positive electrode can be aluminum, titanium, stainless steel, nickel, burned carbon, a conductive polymer, conductive glass, or the like. Besides these, use can be made, as the positive-electrode current collector, of a material obtained by treating the surface of aluminum, copper, or the like with carbon, nickel, titanium, silver, or the like for the purpose of improving adhesiveness, conductivity, and ~~oxidation resistance~~ reduction resistance. The current collector for the negative electrode can be copper, nickel, iron, stainless steel, titanium, aluminum, burned carbon, a conductive polymer, conductive glass, Al-Cd alloy, or the like. Besides these, use can be made, as the negative-electrode current collector, of a material obtained by treating the surface of copper or the like with carbon, nickel, titanium, silver, or the like for the purpose of improving adhesiveness, conductivity, and oxidation resistance. These materials can be subjected to a surface oxidation treatment.

**Please replace the paragraph on page 28, lines 12-16, with the following amended paragraph:**

As the separator for nonaqueous-electrolyte batteries may be used a polymer gel constituted of a polymer of, e.g., acrylonitrile, ethylene oxide, propylene oxide, methyl methacrylate, vinyl acetate, vinylpyrrolidone, ~~poly(vinylidene fluoride)~~ vinylidene fluoride, or the like and an electrolyte.

**Please replace the paragraph on page 33, lines 12-21, with the following amended paragraph:**

Examples of the monomer having isocyanate groups include toluene diisocyanate, diphenylmethane diisocyanate, 1,6-hexamethylene diisocyanate, ~~2,2,4(2,2,4)-~~ 2,4,4-trimethylhexamethylene diisocyanate, p-phenylene diisocyanate, 4,4'-dicyclohexylmethane diisocyanate, 3,3'-dimethyldiphenyl 4,4'-diisocyanate, dianisidine diisocyanate, m-xylene diisocyanate, trimethylxylene diisocyanate, isophorone diisocyanate, 1,5-naphthalene diisocyanate, trans-1,4-cyclohexyl diisocyanate, and lysine diisocyanate.



**Please replace the paragraph on page 36, lines 20-26, with the following amended paragraph:**

Fig. 1 is a sectional view of a nonaqueous-electrolyte battery according to Examples of the invention. Fig. 2 is a presentation showing performances of batteries of the invention and comparative batteries. Numeral 1 denotes a positive electrode, 11 a positive composite, 12 a positive-electrode current collector, ~~2 a negative composite~~ 2 a negative electrode, 21 a negative composite, 22 a negative-electrode current collector, 3 a separator, 4 a power-generating element, and 5 a metal/resin composite film.